



Institute for Research in  
Fundamental Sciences

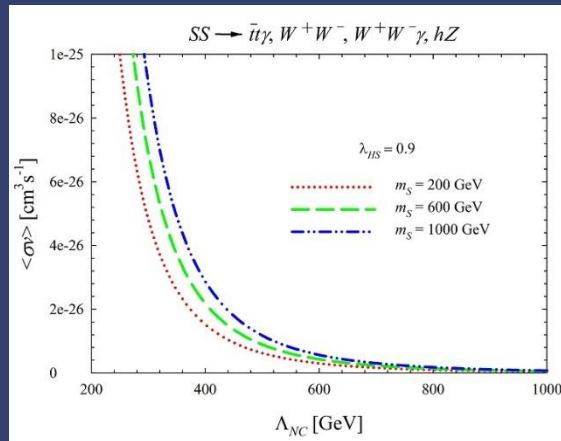
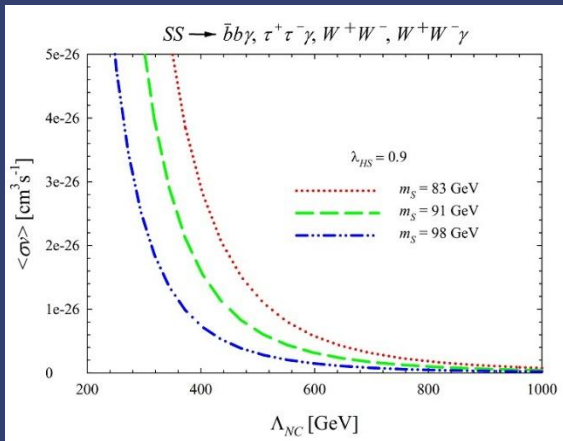
School of Particles and Accelerators; Institute for Research  
in Fundamental Sciences (IPM)

**Title:**  
**Non-commutative space-time: a viable hypothesis to  
explain the  
gamma-ray excess in the galactic center  
[arXiv:2007.01501]**

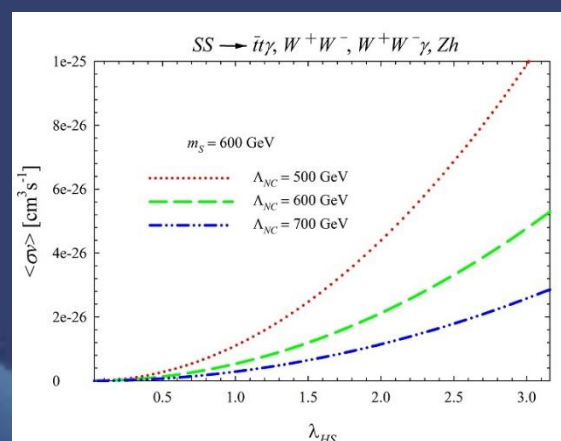
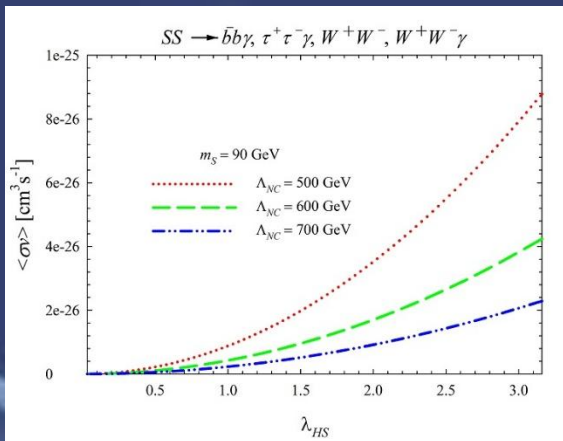
**By:**  
**S. Peyman Zakeri**

**ICHEP 2020**

**July 2020**

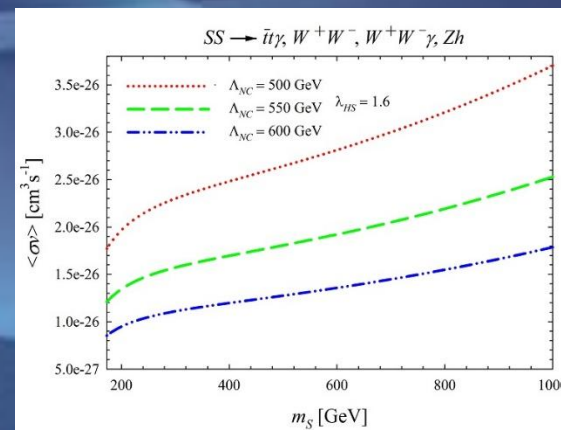
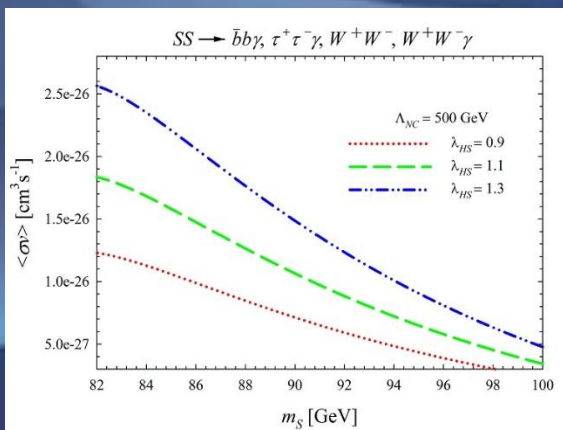


**DM annihilation cross-section**

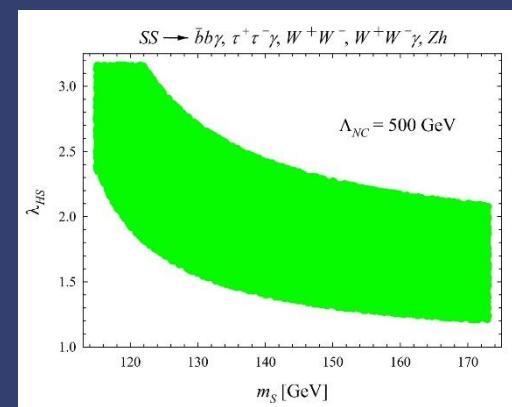
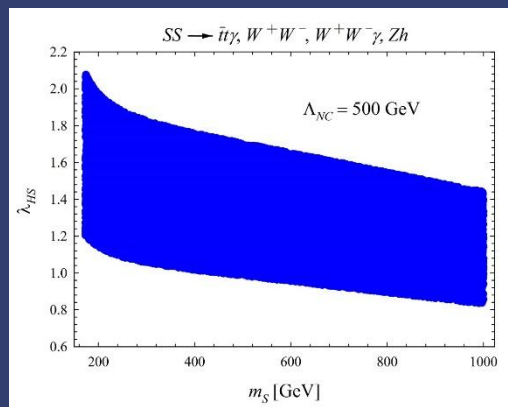
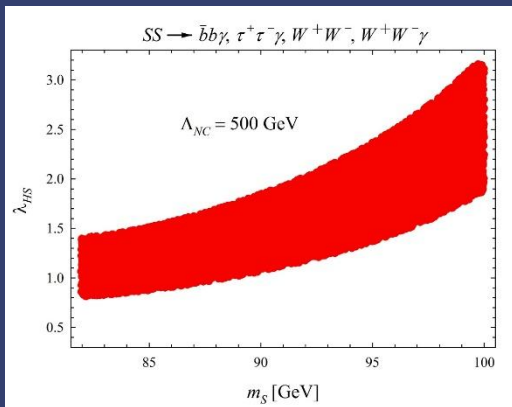


$\Lambda_{NC}$ :  
non-commutative energy scale

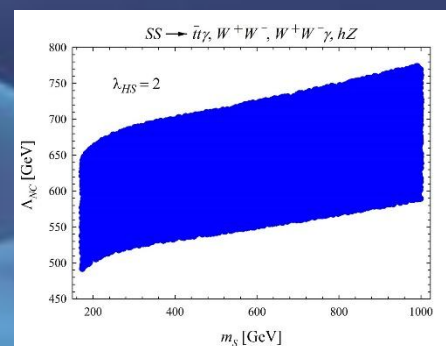
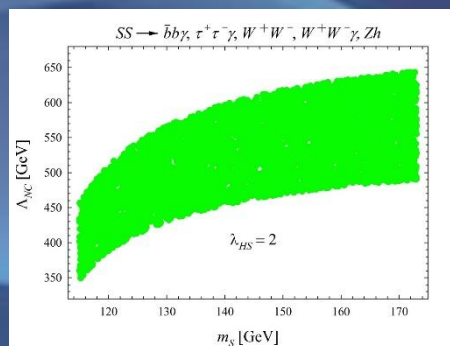
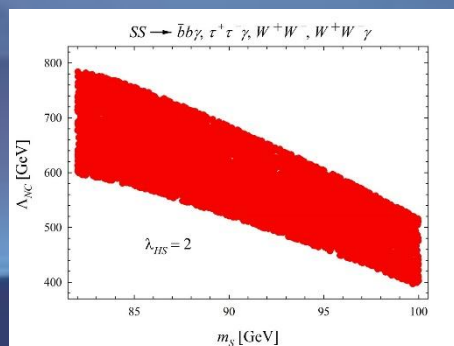
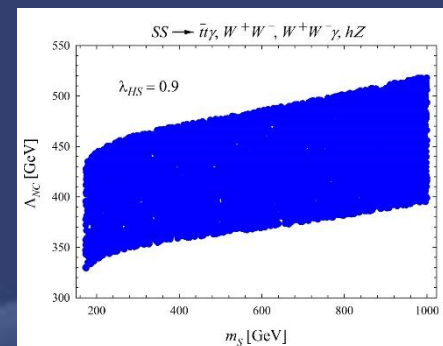
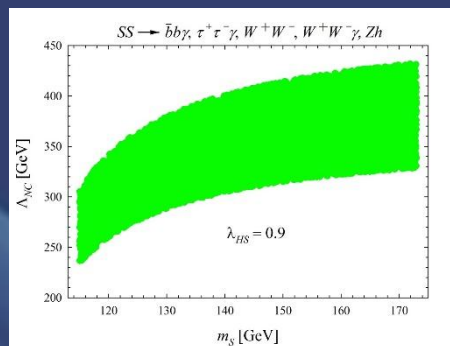
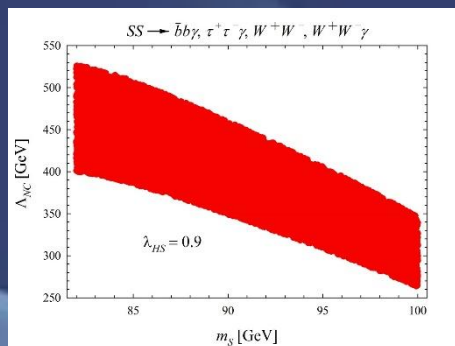
$\lambda_{HS}$ :  
Higgs – DM coupling



$m_S$ :  
DM mass



## Model parameter-space



# Gamma-ray flux

